

IN THE CLAIMS

Claim 1 (original): An integrated circuit for providing drive signals to a piezo element of a milli-actuator device in a mass data storage device, comprising:

a driving circuit for selectively driving said piezo element in either a voltage mode or a charge mode; and

a circuit for compensating said driving circuit for a variable number of piezo elements in a charge mode of operation and providing a compensating feedback signal in a voltage mode of operation.

Claim 2 (original): The integrated circuit of claim 1 wherein said circuit for compensating said driving circuit for a variable number of piezo elements in a charge mode of operation comprises a circuit for adjusting an output impedance of at least a portion of said driving circuit.

Claim 3 (currently amended): The integrated circuit of claim 2 wherein said circuit for adjusting an output impedance of at least a portion of said driving circuit comprises a plurality of resistance providing elements that are selectively connected switched into the circuit.

Claim 4 (original): The integrated circuit of claim 3 wherein said resistance providing elements comprise a plurality of series connected MOSFET devices.

Claim 5 (original): The integrated circuit of claim 3 wherein said resistance providing elements comprise a plurality of integrated resistors.

Claim 6 (original): The integrated circuit of claim 1 further comprising a circuit for containing command data to specify a mode of operation of said integrated circuit.

Claim 7 (previously submitted): The integrated circuit of claim 6 further comprising circuitry for configuring said integrated circuit to operate in a voltage mode

or a charge mode in response to said command data to specify a mode of operation of said integrated circuit.

Claim 8 (previously submitted): The integrated circuit of claim 6 wherein said integrated circuit further comprising circuitry for configuring a parameter of said integrated circuit to compensate for said number of piezo element devices.

Claim 9 (cancelled)

Claim 10 (original): An integrated circuit for providing drive signals to a piezo element of a milli-actuator device in a mass data storage device, said piezo element including a variable number of piezo element devices, comprising:

a Class A amplifier connected to receive input signals for controlling said piezo element;

a Class AB amplifier connected to receive an output from said Class A amplifier to selectively provide either current mode driving signals or voltage mode driving mode signals to said piezo element; and

a circuit for compensating said integrated circuit,

wherein in a charge mode of operation, said circuit for compensating said integrated circuit selectively compensates said Class A amplifier for a variable number of piezo element devices,

and wherein in a voltage mode of operation, said circuit for compensating said integrated circuit provides a compensating feedback signal.

Claim 11 (original): The integrated circuit of claim 10 wherein said circuit for compensating said driving circuit for a variable number of piezo elements comprises a circuit for adjusting an output impedance of said Class A amplifier.

Claim 12 (original): The integrated circuit of claim 11 wherein said circuit for adjusting an output impedance of at said Class A amplifier comprises a plurality of resistance providing elements that are selectively connected in said Class A amplifier.

Claim 13 (original): The integrated circuit of claim 12 wherein said resistance providing elements comprise a plurality of series connected MOSFET devices.

Claim 14 (original): The integrated circuit of claim 12 wherein said resistance providing elements comprise a plurality of integrated resistors.

Claim 15 (original): The integrated circuit of claim 10 further comprising a circuit for containing command data to specify a mode of operation of said integrated circuit.

Claim 16 (original): The integrated circuit of claim 15 further comprising circuitry for configuring said integrated circuit to operate in a voltage mode or a current mode in response to said command data to specify a mode of operation of said integrated circuit.

Claim 17 (original): The integrated circuit of claim 15 wherein said piezo element has a number of piezo element devices, and further comprising circuitry for configuring a parameter of said integrated circuit to compensate for said number of piezo element devices.

Claim 18 (original): The integrated circuit of claim 17 wherein said parameter is an impedance of at least a portion of said integrated circuit.

Claim 19 (previously submitted): A method for providing drive signals to a piezo element of a milli-actuator device in a mass data storage device, including a variable number of piezo element devices, comprising:

selectively driving said piezo element in either a voltage mode or a charge mode; and

compensating said driving circuit for said variable number of piezo element devices in a charge mode of operation and providing a compensating feedback signal in a voltage mode of operation.

Claim 20 (original): The method of claim 19 wherein said compensating said driving circuit for a variable number of piezo element devices in a charge mode of operation comprises adjusting an output impedance of at least a portion of said driving circuit.

Claim 21 (currently amended): The method of claim 20 wherein said adjusting an output impedance of at least a portion of said driving circuit comprises selectively connecting switching a plurality of resistance providing elements into the circuit.

Claim 22 (original): The method of claim 21 wherein said selectively connecting a plurality of resistance providing elements into the circuit comprises selectively connecting a plurality of series connected MOSFET devices into the circuit.

Claim 23 (original): The method of claim 21 wherein said selectively connecting a plurality of resistance providing elements into the circuit comprises selectively connecting a plurality of resistors into the circuit.

Claim 24 (original): The method of claim 19 further comprising containing command data to specify a mode of operation of said integrated circuit.

Claim 25 (previously submitted): The method of claim 24 further comprising configuring said integrated circuit to operate in a voltage mode or a charge mode in response to said command data.

Claim 26 (original): The method of claim 25 wherein said configuring a parameter of said integrated circuit to compensate for said number of piezo element devices comprises configuring an impedance of at least a portion of said integrated circuit.

Claim 27 (original): An integrated circuit for providing drive signals to a piezo element of a milli-actuator device in a mass data storage device, said piezo element including a variable number of piezo element devices, comprising:

means for selectively driving said piezo element in either a voltage mode or a charge mode; and

means for compensating said driving circuit for said variable number of piezo element devices in a charge mode of operation and providing a compensating feedback signal in a voltage mode of operation.

Claim 28 (original): The integrated circuit of claim 27 wherein said means for compensating said driving circuit for a variable number of piezo element devices in a charge mode of operation comprises means for adjusting an output impedance of at least a portion of said driving circuit.

Claim 29 (currently amended): The integrated circuit of claim 28 wherein said means for adjusting an output impedance of at least a portion of said driving circuit comprises means for selectively connecting switching a plurality of resistance providing elements into the circuit.

Claim 30 (original): The integrated circuit of claim 29 wherein said means for selectively connecting a plurality of resistance providing elements into the circuit comprises means for selectively connecting a plurality of series connected MOSFET devices into the circuit.

Claim 31 (original): The integrated circuit of claim 29 wherein said means for selectively connecting a plurality of resistance providing elements into the circuit comprises means for selectively connecting a plurality of resistors into the circuit.

Claim 32 (original): The integrated circuit of claim 27 further comprising means for containing command data to specify a mode of operation of said integrated circuit.

Claim 33 (original): The integrated circuit of claim 32 further comprising means for configuring said integrated circuit to operate in a voltage mode or a current mode in response to said command data.

Claim 34 (original): The integrated circuit of claim 33 wherein said means for configuring a parameter of said integrated circuit to compensate for said number of piezo element devices comprises means for configuring an impedance of at least a portion of said integrated circuit.

Claim 35 (previously submitted): A mass data storage device, comprising:
an integrated circuit for providing drive signals to a piezo element of a milli-actuator device in a mass data storage device, said integrated circuit including:
a driving circuit for selectively driving said piezo element in either a voltage mode or a charge mode; and
a circuit for compensating said driving circuit for a variable number of piezo elements in a charge mode of operation and providing a feedback signal in a voltage mode of operation.

Claim 36 (original): The mass data storage device of claim 35 wherein said circuit for compensating said driving circuit for a variable number of piezo elements in a charge mode of operation comprises a circuit for adjusting an output impedance of at least a portion of said driving circuit.

Claim 37 (currently amended): The mass data storage device of claim 36 wherein said circuit for adjusting an output impedance of at least a portion of said driving circuit comprises a plurality of resistance providing elements that are selectively connected switched into the circuit.

Claim 38 (original): The mass data storage device of claim 37 wherein said resistance providing elements comprise a plurality of series connected MOSFET devices.

Claim 39 (original): The mass data storage device of claim 37 wherein said resistance providing elements comprise a plurality of integrated resistors.

Claim 40 (original): The mass data storage device of claim 35 further comprising a circuit for containing command data to specify a mode of operation of said integrated circuit.

Claim 41 (original): The mass data storage device of claim 40 further comprising circuitry for configuring said integrated circuit to operate in a voltage mode or a current mode in response to said command data to specify a mode of operation of said integrated circuit.

Claim 42 (currently amended): The mass data storage device of claim 40 wherein said mass data storage device further comprising circuitry for configuring a parameter of said integrated circuit to compensate for said number of piezo element devices.

Claim 43 (cancelled)